

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An ultrasonic vibration element comprising:
a single-crystal piezoelectric member cut like an array; and
~~at least one of an upper resin layer formed on an upper surface of the piezoelectric member and having smaller acoustic impedance than the piezoelectric member, and a lower resin layer~~ which is formed on a lower surface of the piezoelectric member and which has having smaller acoustic impedance than the piezoelectric member, ~~wherein the at least one of the upper resin layer and the lower resin layer has an excellent cutting characteristic, [[and]]~~ an excellent conductivity, and functions as an electrode.

Claim 2 (Currently Amended): An ultrasonic probe comprising an ultrasonic vibration element constructed by a 1-3 or 2-2 type composite piezoelectric member including a piezoelectric member formed of solution-based single-crystal ~~containing~~ comprising at least plumbum titanate, and ~~at least one of an upper resin layer formed on an upper surface of the piezoelectric member and having smaller acoustic impedance than the piezoelectric member, and a lower resin layer~~ which is formed on a lower surface of the piezoelectric member and which has ~~having~~ smaller acoustic impedance than the piezoelectric member, ~~wherein the at least one of the upper resin layer and the lower resin layer has an excellent cutting characteristic, [[and]]~~ an excellent conductivity, and functions as an electrode.

Claim 3 (Currently Amended): The probe according to claim 2, wherein the at least one of the upper resin layer and the lower resin layer has acoustic impedance of 2 MRayl to 10 MRayl ~~2×10⁶ g/m² to 10×10⁶ g/m²~~ and functions as an acoustic matching layer.

Claim 4 (Withdrawn) A method of manufacturing an ultrasonic probe, comprising:

a first step of forming a resin layer on at least one of upper and lower surfaces of a single-crystal piezoelectric member, the resin layer having smaller acoustic impedance than the single-crystal piezoelectric member;

a second step of cutting the single-crystal piezoelectric member and the resin layer, thereby to form a plurality of kerfs; and

a third step of filling the plurality of kerfs with resins.

Claim 5 (Withdrawn): The method according to claim 4, wherein the plurality of kerfs are formed like a grid in the second step.

Claim 6 (Withdrawn): The method according to claim 4, further comprising a fourth step of polishing the resin layer to remove the resin layer.

Claim 7 (Withdrawn): A method of manufacturing an ultrasonic probe, comprising:
a first step of adhering a plurality of single-crystal piezoelectric members to a resin sheet;

a second step of cutting the piezoelectric single-crystal members and the resin sheet, thereby to form a plurality of kerfs; and

a third step of filling the plurality of kerfs with resins.

Claim 8 (Currently Amended): An ultrasonic probe comprising:
a plurality of piezoelectric members formed of solution-based single-crystal ~~containing~~ comprising at least plumbum titanate, and arranged like an array;

a first electrode formed on a lower surface of each of the piezoelectric members;

a backing member supporting the plurality of piezoelectric members; and

a first flexible printed wiring board arranged between the first electrodes and the backing member, including a plurality of first pattern wires each having a width smaller than a width of each of the piezoelectric members in a longitudinal direction of the ultrasonic probe, extending in a longitudinal direction of each of the piezoelectric members and

connected to the first electrode along the longitudinal direction of each of the piezoelectric members, and connecting the plurality of pattern wires to an ultrasonic diagnosis apparatus body.

Claim 9 (Previously Presented): The ultrasonic probe according to claim 8, further comprising:

a second electrode formed on an upper surface of each of the piezoelectric members;
and

a second flexible printed wiring board including a plurality of second pattern wires each having a width smaller than a width of each of the piezoelectric members in a longitudinal direction of the ultrasonic probe, and connecting the plurality of second pattern wires to ground.

Claim 10 (Withdrawn): A method of manufacturing an ultrasonic probe, comprising:

a first step of adhering a flexible printed wiring board and a single-crystal piezoelectric member to each other, the flexible printed wiring board having conductive layers each having a predetermined width, which are patterned in parallel on a resin member;
and

a second step of cutting the flexible printed wiring board and the single-crystal piezoelectric member together, along and between the conductive layers, thereby to form a piezoelectric vibration element array having a width smaller than a width of each of the conductive layers.

Claim 11 (Currently Amended): An ultrasonic probe comprising:

a plurality of piezoelectric members formed of solution-based single-crystal ~~containing~~ comprising at least plumbum titanate, and arranged like an array;

a first electrode formed on a lower surface of each of the piezoelectric members;

a backing member supporting the plurality of piezoelectric members;

a first flexible printed wiring board arranged between the first electrodes and the backing member, including a plurality of first pattern wires each having a width smaller than a width of each of the piezoelectric member in a longitudinal direction of the ultrasonic probe, extending in a longitudinal direction of each of the piezoelectric members and connected to the first electrode along the longitudinal direction of each of the piezoelectric members, and connecting the plurality of first pattern wires to an ultrasonic diagnosis apparatus body;

a second electrode formed on an upper surface of each of the piezoelectric members;
and

a second flexible printed wiring board including a plurality of second pattern wires each having a width smaller than a width of each of the piezoelectric member in a longitudinal direction of the ultrasonic probe, and connecting a plurality of the second pattern wires to ground.

Claim 12 (Currently Amended): An ultrasonic vibration element comprising:

a single-crystal piezoelectric member cut like an array; and

~~at least one of an upper resin layer formed on an upper surface of the piezoelectric member and having smaller acoustic impedance than the piezoelectric member, and a lower resin layer~~ which is formed on a lower surface of the piezoelectric member and which has having smaller acoustic impedance than the piezoelectric member, ~~wherein~~

~~the at least one of the upper resin layer and the lower resin layer has an excellent cutting characteristic, [[and]] an excellent conductivity, [[and]] functions as an electrode, [[and]] has an acoustic impedance of $2 \times 10^6 \text{ g/m}^2$ to $10 \times 10^6 \text{ g/m}^2$~~ 2 MRayl to 10 MRayl, and functions as an acoustic matching layer.

Claim 13 (Currently Amended): An ultrasonic probe comprising:

an ultrasonic vibration element constructed by a 1-3 or 2-2 type composite piezoelectric member including,

a piezoelectric member formed of solution-based single-crystal ~~containing~~ comprising at least plumbum titanate, and

~~at least one of an upper resin layer formed on an upper surface of the piezoelectric member and having smaller acoustic impedance than the piezoelectric member, and a lower resin layer~~ which is formed on a lower surface of the piezoelectric member and which has having smaller acoustic impedance than the piezoelectric member, ~~wherein~~

~~the at least one of the upper resin layer and the lower resin layer~~ has an excellent cutting characteristic, ~~[[and]]~~ an excellent conductivity, ~~[[and]]~~ functions as an electrode, ~~[[and]]~~ has acoustic impedance of $2 \times 10^6 \text{ g/m}^2$ ~~to~~ $10 \times 10^6 \text{ g/m}^2$ 2MRayl to 10MRayl and functions as an acoustic matching layer.

Claim 14 (New): The ultrasonic probe according to claim 8, wherein the plurality of first pattern wires extend along an entire length of the piezoelectric member.

Claim 15 (New): The ultrasonic probe according to claim 1, further comprising an upper resin layer which is formed on an upper surface of the piezoelectric member and which has smaller acoustic impedance than the piezoelectric member, an excellent cutting characteristic, an excellent conductivity and functions as an electrode.

Claim 16 (New): The ultrasonic probe according to claim 2, further comprising an upper resin layer which is formed on an upper surface of the piezoelectric member and which has smaller acoustic impedance than the piezoelectric member, an excellent cutting characteristic, an excellent conductivity, functions as an electrode, acoustic impedance of 2 MRayl to 10 MRayl and functions as an acoustic matching layer.

Claim 17 (New): the ultrasonice probe according to claim 12, further comprising an upper resin layer which is formed on an upper surface of the piezoelectric member and which

has smaller acoustic impedance than the piezoelectric member, an excellent cutting characteristic, an excellent conductivity, functions as an electrode, acoustic impedance of 2 MRayl to 10 MRayl and functions as an acoustic matching layer.

Claim 18 (New): the ultrasonic probe according to claim 13, further comprising an upper resin layer which is formed on an upper surface of the piezoelectric member and which has smaller acoustic impedance than the piezoelectric member, an excellent cutting characteristic, an excellent conductivity, functions as an electrode, acoustic impedance of @ MRayl to 10 MRayl and functions as an acoustic matching layer.